

No. 870,050.

PATENTED NOV. 5, 1907.

P. A. ROBBINS.
CONVEYING MACHINE.
APPLICATION FILED JUNE 11, 1906.

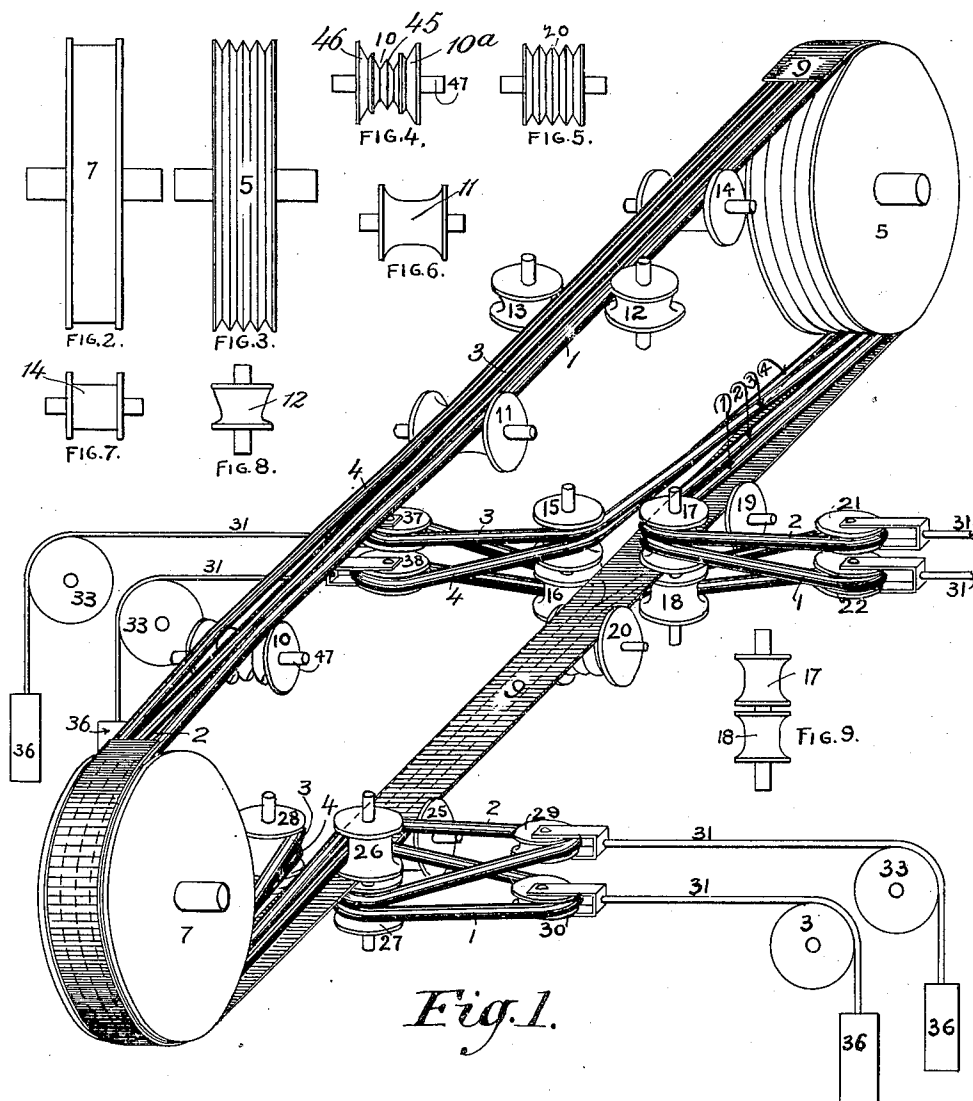


Fig. 1.

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CONVEYING-MACHINE.

No. 870,050.

Specification of Letters Patent.

Patented Nov. 5, 1907.

Application filed June 11, 1906. Serial No. 321,111.

To all whom it may concern:

Be it known that I, PERCY ARTHUR ROBBINS, a citizen of the United States, residing at Englewood, in the county of Bergen and State of New Jersey, have invented a new and useful Conveying-Machine, of which the following is a specification.

My invention relates to improvements in conveying machinery.

The objects of my invention are to produce a conveyer in which a number of endless bands pass around a head pulley and a tail pulley, the bands forming the conveyer between the pulleys. I also provide a covering for these bands in the form of a belt which latter lies upon the bands and forms an even surface. Guide rollers and troughing rollers are used to assist in the proper alining and support of the conveyer. I attain these objects by means of the apparatus shown in the accompanying drawing, in which

Figure 1 is a general view of the entire conveyer, with a portion of the belt covering removed; Fig. 2 is an elevation of the tail pulley; Fig. 3 is an elevation of the head pulley; Fig. 4 is an elevation of a troughing pulley; Fig. 5 is an elevation of a grooved supporting pulley; Fig. 6 is an elevation of a supporting pulley having a concave face; Fig. 7 is an elevation of a supporting pulley having a flat face provided with side webs; Fig. 8 is an elevation of a guide pulley having a concave face and Fig. 9 is an elevation of two deflecting pulleys with concave faces, mounted upon a common shaft.

In Fig. 1 the conveyer between the tops of pulleys 5 and 7 may run in either direction, but for purposes of description I assume that the direction of motion is from the lower left hand end toward the upper right hand end of the Fig. 1.

The endless bands, 1, 2, 3 and 4 are stretched over the pulleys 5 and 7. Starting at the pulley 5 band 1 passes around pulley 5, from thence to the deflection pulley 17, from thence to the tightening pulley 22, from thence to the deflecting pulley 18, from thence over the grooved guide pulley 20, from thence over the grooved guide pulley 25, from thence to the deflecting pulley 27, from thence around the tightening pulley 30, from thence to the deflecting pulley 26, from thence to the tail pulley 7, from thence to the troughing pulley 10, from thence to the troughing pulley 11, from thence to the guide pulley 12, from thence to the supporting pulley 14, and from thence back to the pulley 5. The endless band 2 passes in sequence over the pulleys 5, 19, 17, 21, 18, 20, 25, 27, 29, 26, 7, 10, 11, 12, 14 and back to 5. The endless band 3 passes in sequence over the pulleys 5, 19, 15, 37, 16, 20, 25, from thence around a pulley, not shown, but mounted upon the same shaft with pulley 28, from thence around a tightening pulley, not shown, but similar to pulleys 37 and 38, from thence to pulleys 28, 7, 10, 11, 12, 14, and back to 5. The endless band 4 passes in sequence over

the pulleys 5, 15, 38, 16, 20, 25, from thence around a pulley, not shown, but mounted upon the same shaft with pulley 28, from thence around a tightening pulley, not shown, but similar to pulleys 37 and 38, from thence to pulleys 28, 7, 10, 11, 12, 14, and back to 5

The pulley 29 is movable and is attached to the rope 31, which latter passes over the pulley 33 and suspends the weight 36, thus tightening the band 1. By similar arrangements the pulleys 30, 21, 22, 37, 38, and the two, not shown, are made to keep the endless bands 2, 3 and 4 tight.

9 is an endless belt which passes around pulley 5, over pulley 19, from thence is carried by the bands 1, 2, 3 and 4 to pulley 25, from thence it passes around pulley 7, and from thence is carried by the bands 1, 2, 3 and 4, back to pulley 5. A section of the belt is shown removed between the tops of pulley 7 and pulley 5. The endless bands 1, 2, 3 and 4 are deflected, as shown in Fig. 1, so as to pass under the belt 9 between pulleys 20 and 25, thus supporting the belt 9 and preventing it from sagging down.

In my drawing I have shown four endless bands 1, 2, 3 and 4, but my invention covers the use of any number of similar bands. These bands may be made of any materials or substances which have the requisite strength and durability. I specify the following as being particularly suitable: iron, steel, aluminium, brass, bronze, hemp, cotton, flax, hair, raw hide, tanned leather and rubber; or any combination of the above materials.

The endless belt 9 may be made of any materials or combinations having the necessary strength and durability. I specify the following as being particularly suitable: iron, steel, aluminium, brass, bronze, hemp, cotton, flax, hair, raw hide, tanned leather and rubber; and any combination of the above materials.

Fig. 2 is an elevation of the pulley 7, having a flat face and side webs. Fig. 3 is an elevation of the pulley 5, having a number of circumferential parallel grooves in its outer surface. My drawing shows four grooves, but my invention covers the use of a pulley 5 having any number of circumferential parallel grooves in its surface. Fig. 4 shows an elevation of the troughing pulley 10. This pulley is made up of four parts, the shaft 47, the central part 45, the end part 10^a and the end part 46. The end parts 10^a and 46 are loose upon the shaft 47, but the central part 45 is fixed to the shaft 47, or the central part 45 may be loose upon the shaft and the outer parts 10^a and 46 may be fixed to the shaft. Each of the parts 10^a, 45 and 46 may have any number of circumferential parallel grooves in their respective surfaces. The use of the pulley 10 is to cause the bands 1, 2, 3 and 4 and the belt 9 to form a trough and thus concentrate the material being conveyed, upon the middle of the conveyer.

Fig. 6 shows an elevation of the pulley 11, having a

concave face, the use of this pulley is to support the conveyer at any intermediate point between the pulleys 5 and 7 and to preserve the troughing effect imparted by pulley 10.

Fig. 7 is an elevation of the pulleys 14 and 19, which have flat faces with projecting end webs. The use of these pulleys is to support the conveyer at intermediate points between the pulleys 5 and 7.

Fig. 8 is an elevation of the pulleys 12 and 13 having concave faces. The use of these pulleys is to prevent the bands 1, 2, 3 and 4 from spreading apart from each other.

Fig. 5 is an elevation of the pulleys 20 and 25 which have a number of circumferential parallel grooves in their surface. My drawing shows only four grooves, but my invention covers the use of pulleys having any number of circumferential parallel grooves in their surfaces. The use of the pulleys 20 and 25 is to support the bands 1, 2, 3 and 4 at any intermediate points between the pulleys 5 and 7.

Fig. 9 is an elevation of the pulleys 15 and 16, 17 and 18, 26 and 27, 28 and one not shown. These pulleys are mounted in pairs upon a common shaft with a space between the lower end of the upper pulley and the upper end of the lower pulley, the pulleys have concave faces and are used for deflecting the bands 1, 2, 3 and 4.

The arrangement of pulleys need not necessarily be exactly as shown and described, nor is it necessary to use only the number of pulleys shown. The conveyer under certain conditions may be constructed without any intermediate pulleys between the head pulley 5 and the tail pulley 7; while to satisfy other conditions it may be necessary to increase the number of intermediate pulleys. It is not necessary in every case to use each of the different forms of pulleys, as described, some conditions may require that only one of the several forms shall be used, while other conditions may require only the use of a different form.

Obviously any number of any one of the described forms of pulleys may be used or all of the different forms described may be used, without departing from the spirit of my invention.

In my drawing I have not shown any bearings or framing for supporting the various parts, but it is my intention to support all pulley shafts in suitable bearings mounted upon suitable framing.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A conveyer comprising head and tail rollers a plurality of endless bands arranged substantially parallel to each other, an endless belt supported by said bands and means independent of said rollers for tightening said bands.

2. A conveyer comprising head and tail rollers a plu-

rality of independent endless traveling bands, an endless traveling belt supported by said bands and means independent of said rollers for tightening said bands.

3. A conveyer comprising a plurality of endless bands, and an endless belt supported substantially throughout its upper length and throughout a portion of its lower length by said bands.

4. A conveyer comprising a plurality of endless traveling bands, and an endless belt supported on top of the upper lengths of said bands, and on top of a portion of the lower lengths of said bands.

5. A conveyer comprising head and tail pulleys, a plurality of endless bands passing around said pulleys, grooved troughing pulleys, an endless belt supported by said bands, deflecting pulleys intermediate the length of said bands, and tightening pulleys for holding the bands tight.

6. A conveyer comprising head and tail pulleys, one of which is provided with grooves, a plurality of endless bands passing around said pulleys, grooved troughing pulleys, an endless belt supported by said bands, deflecting pulleys intermediate the length of said bands, and tightening pulleys for holding the bands tight.

7. A conveyer comprising a plurality of endless traveling bands arranged substantially parallel to each other, an endless belt supported by said bands, and means for deflecting said bands from one side of the lower length of the belt, and returning them to the opposite side of said length of the belt.

8. A conveyer comprising a plurality of endless traveling bands arranged substantially parallel to each other, an endless belt supported by said bands, and means for deflecting said bands from the upper side of the lower length of the belt to the lower side of said length of the belt.

9. A conveyer comprising a plurality of endless traveling bands arranged substantially parallel to each other, an endless belt supported by said bands, means for deflecting said bands from the upper surface of the lower length of the belt to the lower surface, and means for again deflecting the bands from the lower surface to the upper surface of said length of belt, whereby the belt is supported throughout a portion of its lower length by said bands.

10. The combination, in a conveyer consisting of a number of endless bands and an endless belt, of a number of pulleys by means of which the endless bands are deflected from one side of the endless belt and returned to the opposite side of the endless belt, all substantially as set forth.

11. In combination with a conveyer consisting of a number of endless bands, a supporting pulley consisting of a number of sections mounted upon a common shaft, each section having one or more circumferential grooves in its surface, one or more sections being fixed to the shaft and one or more sections being free to revolve upon the shaft, the shaft being adapted to be carried in suitable bearings, all substantially as set forth.

12. In combination with a conveyer consisting of a number of endless bands, two deflecting pulleys with concave faces mounted upon a common shaft carried in suitable bearings, all substantially as set forth.

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Witnesses:

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